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OUR PUBLIC LANDS

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Winter 1968





DEPARTMENT OF THE INTERIOR

Stewart L. Udall, Secretary

BUREAU OF LAND MANAGEMENT

Boyd L. Rasmussen, Director

Created in 1849, the Department of the Interior—a Department of Conservation—is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

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Ed Parker, Editor.

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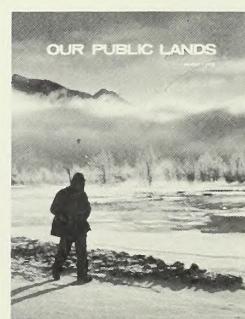
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The Cover



Solitude and beauty surround a lone hunter near Knik Glacier in Alaska.

Photo by D. Gilchrist

HIGHLIGHTS

Red Rock Cleanup Campaign Receives Keep America Beautiful Youth Award

The success of the Red Rock cleanup campaign in restoring public pride in the Red Rock recreation area west of Las Vegas, Nev., was recognized November 9, 1967 by a Keep America Beautiful (KAB) Youth Award. Cleanup of the area, which is on public lands, has been a 3-year cooperative effort between BLM and citizens of Las Vegas.

Explorer Scout Greg Kennedy, Boulder Dam Area Scout Council, and Dennis E. Hess, manager of BLM's Las Vegas District, accepted the engraved bronze cup on behalf of campaign participants at KAB's annual awards luncheon in New York.

Reuben L. Perin, KAB president, said many of the country's young people are willingly lending time and effort to preserve our Nation's beauty. The award was one of seven given by KAB in 1967 for outstanding litter-prevention projects carried out by young people. A report on the campaign, "Valuable Volunteers," was in the Fall 1967 issue of "Our Public Lands." The area itself was dedicated as the Red Rock Canyon Recreation Lands on October 29, 1967 (see pages 12-13, this issue.)

Rasmussen Addresses Forestry Conference

BLM Director Boyd L. Rasmussen was the principle speaker at the American Forestry Association's 92nd Annual Conference in Las Vegas, Nev., October 29-November 1, 1967. In the speech he proposed still another definition for the practice of conservation.

"I'd like to call it 'making the wiser choice'—with stress on the word 'wiser.' We do have many choices in the management of our natural resources. We can exploit them to exhaustion, we can preserve them intact, or we can seek a happy balance between consumption and renewal."

He said, "I don't believe the present-day natural resource administrator can make major policy decisions

alone—or even aided by the talents of his staff. He must listen to the advice of special interest groups. He must also seek counsel from the broadest range of individuals and organizations. Then, and only then, can he be certain that he considered the alternatives in the public interest."

He added later that "Our ultimate goal is to benefit people—now and in the long run. As conservationists concerned with natural resources, we might sometimes wish people were not the overriding factor. But as we seek to make the wiser choices, the needs of people must be uppermost in our minds."

BLM Announces Wild Horse Policy

Public lands supporting bands of wild horses may be managed to provide forage and water for the animals, according to a recent policy statement issued by the Bureau of Land Management. The policy statement calls for cooperation with State and local governments, wild horse protective associations, and local ranchers in designating management areas. The control of wild horse populations will remain the responsibility of State and local agencies.

BLM Cooperates in Protecting Aquatic Life

The Bureau of Land Management will work with the Geological Survey and the Fish and Wildlife Service to protect aquatic resources that might be harmed during mineral exploration and development on the Outer Continental Shelf.

Portions of these submerged lands, which cover at least 850,000 square miles, are rich in petroleum, natural gas, and sulphur.

"As these resources are developed more fully, it becomes increasingly important for Interior to exercise its legal responsibility for safeguarding aquatic resources," Secretary Udall said. "Experts from each agency will work together in the field and in Washington to see that the delicate ecological system that prevails on the Outer Continental Shelf is not harmed."

Fiscal Year 1967 Oil and Gas Lease Collections Total \$896 Million

Oil and gas leasing on the public lands earned more than \$896 million during the 12 months ending June 30, 1967.

The total includes all monies from bonuses and rentals on public domain, acquired land, and the Outer Continental Shelf, and \$148 million in escrow accounts.



Scouts replace a restroom roof while adults take a coffee break.

MESS AT MIRACLE ROCK

Young Americans and community spirit undo the work of vandals

AFTER VANDALS hit BLM's new Miracle Rock Recreation site 25 miles southwest of Grand Junction, Colo., the vicinity looked like top priority for classification as a national disaster area.

Reinforced fiber glass roofing was ripped from restrooms. Metal toilets were smashed. Picnic tables and fireplace grills were overturned. Chained-down garbage cans anchored in concrete were scattered about, and the concrete bases shattered. A recently-installed bulletin board and a large glass-covered map and display board were destroyed. The pump handle on the site's only well was broken off for the fourth time within a few weeks, and the pump was damaged. Bottles were broken, and the site was littered with glass and other debris.

Damage was so great that Keith Miller, BLM district manager at Grand Junction, estimated that just cleaning up the area would cost more than all of the recreation maintenance funds allotted his district for the entire year.

A Popular Attraction

Since the site was developed for \$38,000 a year ago, Miracle Rock had become a popular picnic and camping area for tourists as well as the people of Colorado's Western Slope. Located near Colorado National Monument in rough, rocky, pinon-juniper canyon country, the site is ideal for picnicking, camping, scenic viewing, hiking, swimming, and rock hunting. It contains 15 family camp and trailer sites, 10 picnic sites, wood fireplaces and charcoal grills, fresh water, and sanita-

Photos courtesy of the Grand Junction Daily Sentinel.

Keith Miller, BLM's Grand Junction District Manager, surveys some of the damage.



ion facilities. Nearby is a rock weighing many tons that has been sculptured by erosion until it is now balanced on a 12-inch base. Also nearby are natural bridges and arches formed by the same process, and interesting potholes caused by waterfalls in the Little Dolores River.

But this is not so much the story of senseless and vicious destruction of an idyllic spot by vandals as it is the story of community cooperation and young Americanism.

When Keith Miller spread the word last June about what had happened at Miracle Rock, things began to happen in Grand Junction. Local newspapers and radio and television stations reported the event and urged assistance in finding the vandals. The public responded. Persons who had been in the area reported possible clues. A businessman offered a \$100 reward for information leading to the arrest and conviction of those responsible. Almost the entire community became involved in helping find the vandals.

Vandals Caught

Four days after the destruction, two youths, one on probation from a larceny conviction, were arrested and bound over to the Federal district court in Denver. The one on probation for a previous conviction was given two years probation while the other faces trial.

In the meantime, community spirit continued to blossom. Not content with their all-out effort to help find the vandals, individuals, groups, and organizations began volunteering to help clean up and rebuild the area. They offered both manpower and materials—each badly needed as district BLM funds and available manpower couldn't handle the job alone. Offers came from

Aftermath of vandals.



the Kiwanis Club, the Moose Lodge, the Colorado Sportsmen's Association, the Boy Scouts, and other organizations, as well as individual young people and adults.

Undoing the Vandals' Work

Most of the credit for the rebuilding work goes to the Boy Scouts of the Grand Mesa district, their leader, Milton Walls, and fathers of the boys. Businessmen and organizations contributed tools and supplies. Scouts from the 39 units in the Grand Mesa district met and accepted specific tasks by troops and work groups. After the area had been cleaned up, Scouts poured concrete for garbage can bases. Other Scouts rebuilt the bulletin board and display board. A group took over the repair of the pump, while another group replaced the roof on restrooms. Metal toilets and garbage cans were hammered back in shape and welded, picnic tables were planed and sanded, and all other damage to facilities was repaired.

As an expression of appreciation, E. I. Rowland, State BLM director in Denver, flew to Grand Junction with a certificate of commendation which was presented to the Boy Scouts of the Grand Mesa District jointly by Rowland and Miller on behalf of the Bureau. It reads:

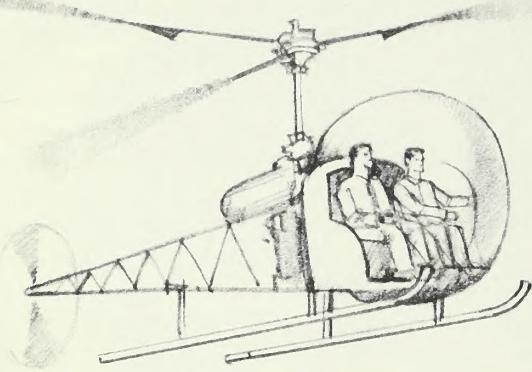
"For outstanding performance reflecting the highest ideals of Scouting, Americanism, and Community Service in restoring facilities at the Miracle Rock Recreation Site following major damage by vandals." □

By NORMAN W. NOBLE

Assistant to the State Director
BLM State Office, Denver, Colo.

Refinishing a picnic table.





JUMPING-OFF PLACE

*He measured much land,
but no one now remembers
grave of Thomas Hutchins*

AND NOW, HELICOPTERS

Surveying is an ancient art whose beginnings are lost to history. Many of its basic principles date to the early Egyptians, and the Bible refers to preserving and honoring monuments marking land boundaries (Proverbs 22:28).

Surveying is a highly respected profession, and many men prominent in the formation and development of our Nation have come from the ranks of surveyors. George Washington surveyed many land boundaries in Virginia; Thomas Jefferson took an active part in planning for the survey of the public lands.

Over the years, surveying techniques have progressed with a changing technology. Special instruments have made the helicopter a surveying tool that can hover exactly over a point 300 feet below. Electronic measuring devices span miles in split seconds. Other instruments solve the celestial triangle without time-consuming computation, and aerial photography accurately records the twistings of river, lake, and ocean shores.

Yet modern surveyors are not too modern to mix the old with the new if that's what it takes to get the job done. The man riding "shotgun" on a helicopter survey may be backpacking the next time.

If Thomas Hutchins could come back for a visit, he'd soon feel right at home with fellow surveyors.



HISTORICAL MARKING has been big in America for over a century, but it hasn't always been timed in accordance with the size of importance of the matters involved. Or even the dramatic value.

For more than 100 years there have been markers at the point where Mason and Dixon began their historic survey. But it was only recently that the Point of Beginning—the jumping-off place of the greatest survey the world has ever known—received the full recognition it deserves. On September 30, 1966, community leaders and representatives of the Bureau of Land Management gathered near East Liverpool, Ohio, and dedicated the Point of Beginning as a National Historic Landmark, the spot where the United States began its national land survey.

And though it is just over 30 airline miles from the Point, and the man in charge was a Pittsburgher, no Pittsburgh history mentions it, or his connection with the city except as a soldier.

He was Thomas Hutchins, soldier, adventurer, engineer, diplomat, author, traveler, and for most of his last decade the Geographer General of the United States.

Hutchins was equally at home in city, wilderness, or barracks, and though he must have had little formal schooling, he was one of the best-read and most literate men of his day. Never a man to talk about himself, he allowed some of his work to be published anonymously. Much of his story is unknown, and our only clue to his appearance is preserved in a one-word allusion to his stature as "small."

But there was nothing else small about Hutchins or his achievements.

Born in Monmouth County, N.J., somewhere around 1730, he was early left an orphan, and at 10 he was on the frontier, making his way as best he could. By 1756 he had the rank of ensign in a British regiment, and the following year he was a lieutenant, and recognized as an engineer. His work was neat and (for the day) accurate, and he wrote fluently, both as to handwriting and use of words.

After the French abandoned Fort Duquesne at the approach of the Forbes expedition, Hutchins was sent

to map the road to Venango and Erie, and in 1760 became assistant agent of Indian affairs there.

Hutchins went with Col. Henry Bouquet on his expedition against the Indians in Ohio in 1764, following the end of Pontiac's war. He mapped the course of the Army, and almost all scholars are convinced he was the author of a book on the subject printed a few months later, anonymously, but with a note that it was written by a member of the force.

In West and South

From 1766-71 Hutchins was in Illinois, where he helped break up an Army swindle, and for the next five years was in Pensacola, helping set up the defenses of West Florida.

Going to England when the American Revolution broke out, Hutchins tried to keep his commission by being assigned to the West Indies, but refused to serve against his countrymen, even when offered the rank of major. Finally he was jailed for treason, and when released he fled secretly to France, where he contacted Benjamin Franklin. With his backing and that of George Washington, Hutchins returned to America and was made geographer to the southern armies, a title changed in 1781 to Geographer of the United States.

In this capacity he traveled from Maine to Georgia, and prepared numerous helpful reports. It was natural that Congress would turn to him to begin the biggest surveying job in history.

Although the new nation extended to the Mississippi River, there were very few settlers west of the mountains except in Kentucky and along the Ohio. The colonies had ceded their land claims west of Pennsylvania and Virginia to the new nation, but most of the area was still little known.

The Confederation was a very loose one, and the United States had very little way to get any money to pay off the costs of the war. And by far the best way to get any cash appeared to be selling off blocks of the new lands.

A group of New England investors had formed a new Ohio Company to settle what is now part of that state, and petitioned that their purchases be assigned them in blocks either six miles square, six by nine, or six by 12 miles. Since the request was made by Manasseh Cutler, head of the Ohio Company, some have thought he was the father of this system. But research

By **GEORGE SWETNAM**

Pittsburgh Press Staff Writer

(Reprinted by permission of the Pittsburgh Press)

shows that Hutchins had recommended it long before, and had made some of his surveys by townships six miles square as early as 1764.

Thomas Jefferson, who wrote the committee report in his own hand, recommended that "It (public land) shall be divided into hundreds of blocks ten geographical miles square . . . by lines to be run and marked due north and south, and others crossing these at right angles."

The 10-mile figure was characteristic of Jefferson, who was strongly for a decimal system to simplify record keeping. Some of the older states were for the former system of letting settlers take up lands where they wanted them, hit or miss. In the final compromise the Congress went along with the six-mile grids of Hutchins. Perhaps the main reason was that in a day when most people walked where they wanted to go, a township six miles square was about as large as was convenient. Many New England townships contained 36 square miles, but were not necessarily even in shape.

Final Draft

As finally passed, the law directed that surveys of the western lands should be in townships six miles square, the square miles numbered in a special way, with the townships arranged in "ranges" north and south, and numbered by their position east or west of conveniently chosen meridians.

The original draft also directed that the survey begin where an extension of the boundary between Pennsylvania and Maryland met the Ohio River. That would be the Mason and Dixon line, which had been halted nearly 20 years earlier when Indians refused to let the surveyors go farther west than Dunkard Creek, in present-day Greene County.

When the Mason and Dixon line was completed in 1784, it ended before reaching the river, and Hutchins may have pointed this out. In the final form the bill read: ". . . on the River Ohio at a point that should be found to be due north from the western terminus of a line which has been run as the southern boundary of the State of Pennsylvania."

Since this would be affected by the western boundary, a north line was run by the boundary commissioners of Virginia and Pennsylvania. They established the point of origin for the new survey on August 20, 1785, and "set a stake on the flat, the north side of the River."

The survey began a little over a month later on September 30. The act of Congress had directed that Hutchins himself run the east-west line (the Geographer's Line) and that the entire survey be corrected by sightings on the stars.

Neither one was carried out. One of Hutchins' deputies, William Morris, of New York, began it, but had to give up after the first four miles, because of Indian threats. (This wasn't the land speculator who helped finance the Revolution. The name offers many pitfalls to the unwary historian.)

Another deputy, Absalom Martin, started all over again the next year and ran the line for the prescribed 42 miles. The end was off by 1,500 feet, to the south.

Nor was the survey made as accurately as directed, or as soon as Congress hoped. Because of Indian dangers and the time which would have been required for astronomical checking, the job was rather hastily and inaccurately done. Even then it took three years, instead of one.

But the important thing was the beginning. For the first time in a world that had been surveying plots for 5,000 years, a nation had started a plan by which every spot could be easily and accurately located. Methods were gradually defined, until now if a piece of land is designated as "the northeast quarter of the southeast quarter, Section 9, Range 5, east of the Choctaw meridian," a man who never saw a surveyor's tools or was in the State before can locate his 40 acres without any trouble.

Today—after nearly two centuries and a billion acres—the great survey is still going on. Now it is done by professional government surveyors, and a considerable part of their job is correcting errors (and some frauds) of contract surveyors who handled the job before 1910. But there are still 465 million acres of unsurveyed public lands.

Other nations are beginning to awake to the advantages of having such a system, and some are hoping to use it as a means of promoting democratic government and private ownership.

And it all began just over 30 miles from Pittsburgh.

How proud Thomas Hutchins would be if he could see the extent to which his work has reached, but he had hardly more time than just to see the completion of seven ranges in Ohio.

He died in Pittsburgh, at the home of his friend, John Ormsby, on April 28, 1789, and John Heckewelder, the great Moravian missionary, and also his friend, conducted his funeral. He was buried in the old graveyard on Virgin Alley (now Oliver Avenue). When many of the bodies were removed to Allegheny Cemetery his tomb could not be located, but he may be one of the unidentified dead who were taken there.

Perhaps the best comment was contained in a newspaper account of his death: "He measured much earth, but a small space now contains him." □



BLM instructors teach conservation

THE 12th World Boy Scout Jamboree, held at Farragut State Park in northern Idaho, August 1-9, 1967, is gradually fading into a thrilling memory for about 10,000 Boy Scouts and their leaders from all over the world. For most of them it was the crowning experience of their scouting career—a first-time attendance at a World Jamboree. For some, it was also the first time away from their homeland—a venture into a strange and wonderful new country. For all, it was an exciting adventure, and one that will not soon be forgotten.

Only a handful of resource managers from the Bureau of Land Management had the privilege of serving on the conservation staff for the Jamboree. Those who served were selected from a sizable group of volunteer applicants, any one of whom could have made a worthwhile contribution to the conservation education programs for scouts attending the Jamboree. From the

By AUSTIN F. HAMER
Assistant to the State Director
BLM State Office, Boise, Idaho

ranks of foresters came Donald G. Halsey, California State Office, and Howard L. Richmond, Missoula. Robert D. Martin, soil and watershed specialist at the Portland Service Center, and Richard M. Huff, Prineville, Oreg., provided the range management background. Area Manager Donald J. Seibert, of the Glenwood Springs District, Colo., was the wildlife man. Austin F. Hamer, former wildlife biologist-educator, and now Assistant to the State Director in the Idaho State Office, served as coordinator for the group.

The Bureau of Land Management was just one of the many agencies which provided instructor-guides for the two conservation areas which were operated. In all, about 30 men, representing most of the Department of the Interior and Department of Agriculture resource management agencies, served. They were assigned duty on a daily schedule which called for a conducted tour about every two hours of the four conservation stations—earth, water, plant life, and animal life resources. A few instructors were selected because of their foreign language speaking abilities. Some of the Spanish, Italian, French, and German speaking groups did not have interpreters, and these men were assigned only to those groups which needed their services.

In addition to providing men on the two conservation areas, BLM helped man the joint BLM-U.S. Forest Service exhibit which consisted of a standard Forest Service-type lookout tower fully equipped. After the Jamboree, the tower was to be moved by the Coeur d'Alene National Forest to a permanent location on Little Joe Mountain on the Idaho-Montana border. LaForrest Twitchell and Kenneth Egerman, both of the Boise Interagency Fire Center, answered visitor's questions during the first week of the Jamboree. They were replaced by Duane Graves and Pat Barden, BIFC, for the second week. They estimated that they had approximately 500 visitors each day. □





Shingles for the roof.

JOB CORPSMEN GAIN FORESTRY SKILLS

Corpsmen work on seed orchard projects in Oregon

JIMMY O. is a dropout. He cannot read, he cannot write, he cannot get or hold a job. Jimmy O. has lived all of his 18 years deep in the middle of the city, with hardly a tree in sight.

Today Jimmy O. is far away from the city. He is deep in the forests of Oregon, working on one of two projects run by the BLM Job Corps Conservation Centers there. He is learning skills in a number of fields which will perhaps enable him to take more advanced training or to get a job after graduation from the Corps.

Corpsmen like Jimmy O. are working to develop seed orchards which will lead to the eventual improvement of forest trees in many areas of Western Oregon. Corps-

men from the Tillamook JCCC have been working on a Douglas-fir seed orchard near Colton, Oreg., since late in 1965. A similar project was started last summer near Merlin, Oreg., by the Fort Vannoy JCCC.

Before he came to Oregon, Jimmy didn't know what a seed orchard was. Now he can tell you all about it.

Developing Seed Producers

Forest tree seed orchards produce seeds of superior trees growing at known elevations and geographic locations. To develop seed producers, "rootstock" seedlings are planted. After 2-5 years, when the seedlings have reached the proper size, cuttings or branches from superior trees of the same species are grafted onto the young plants. Trees from which cuttings are taken are those that show fast growth, straight trunks, small limbs, and other good characteristics. Trees later grown from the seeds of this first generation are then used to reforest cut-over or burned-over forest land.

What's Jimmy learning? Before he can get into planting, grafting, and seed collecting, there's a lot of preliminary work. The land must be cultivated and fenced, an irrigation system developed, and buildings and facilities erected on the site.

At Colton, the corpsmen's accomplishments include clearing and cultivating 60 acres of land, cutting and treating fence posts and putting up 1 1/4 miles of deer-proof fence, landscaping, and tree planting. They have also built living, dining, and shop buildings, and installed a septic tank and drain field.

Corpsmen Graft Cuttings

Corpsmen at Colton have even tried their hand at grafting a few cuttings. As cuttings are collected, they are grafted onto trees near the orchard site for "storage" until the rootstock is ready for the final graft. Corpsmen have done most of this work. Bill Taylor, forester in charge of the project, reports that most of the corpsmen's grafts have survived despite the high risk of loss involved.

Two crews of corpsmen are used on the project. While one crew works at the seed orchard, the other is in school at the Tillamook Center. They alternate each week.

Work plans for 1968 include landscaping the building area, seeding and fertilizing, tree planting, cone collecting, and the construction of a tool shed and cone storage building, as well as general maintenance and operation.

At the Merlin seed orchard project, corpsmen from the Fort Vannoy JCCC will be working primarily with sugar pine, a species of white pine. The goal at Merlin is to develop trees that will be resistant to white pine blister rust, a fungus that uses gooseberry or currants as host plants and attacks all species of white pines. The rust appears as cankers in the bark of young trees and eventually kills them. Entire stands are sometimes affected.

Wrapping a graft.



The Greatest Hope

Various methods for eradicating the fungus have been developed, but they have proven expensive and difficult. The principal method was to eliminate all the host plants around a stand of trees, but in recent years a "serum" was developed which helped to make some pines disease-resistant. Foresters now place the greatest hope in developing rust-free trees through genetic improvement, and the work at the Merlin orchard will be a major step forward in this field. The genes from rust-resistant trees are preserved through grafting, and through controlled cross-breeding the natural resistance to disease of superior trees is transmitted to succeeding generations.

Fort Vannoy Job Corpsmen have cleared almost 40 acres of land, moved many thousands of cubic yards of soil, installed culverts, and relocated two streams. The schedule for 1968 includes clearing and cultivating more land, building roads and fences, relocating three more streams, constructing a dam and water reservoir, installing a sprinkler system, drilling two wells, and building pump houses.

By the end of 1972, the seed orchard will be enlarged to 200 acres. There will be 32 acres of inoculated, rust-resistant sugar pines, 60 acres of immune sugar pine progeny, 35 acres of superior Douglas-fir, and 35 acres of high-quality ponderosa pine.

A Lasting Contribution

Jimmy O. and his fellow corpsmen are making, in their own way, a lasting contribution to their country by working on the Merlin and Colton seed orchard projects. Both will have long-range benefits for American forestry, and both will help meet the rapidly increasing demand for forest products from public lands. The work that will be done at Merlin, for example, will substantially improve the chances for survival of the endangered sugar pine species, and it is hoped that the Colton project will provide Douglas-fir planting stock needs for 75 per cent of BLM lands in western Oregon.

But equally important for the Job Corps enrollees is the experience of working in forestry. Young men like Jimmy O. are taking pride, often for the first time, in doing a job well, and they are developing skills and work habits that will give them a good start towards finding and keeping jobs.

Good luck, and thank you, Jimmy O. □

By BLAIR RIEPMA GAINES

Writer-Editor

Washington, D.C.



RED ROCK CANYON RECREATION LANDS

NEAR Las Vegas, Nev., on the afternoon of October 29, 1967, the Nation's outdoor recreation resource was further enriched when 70,000 acres of scenic canyons, mountains, and desert were dedicated to the use and enjoyment of present and future generations.

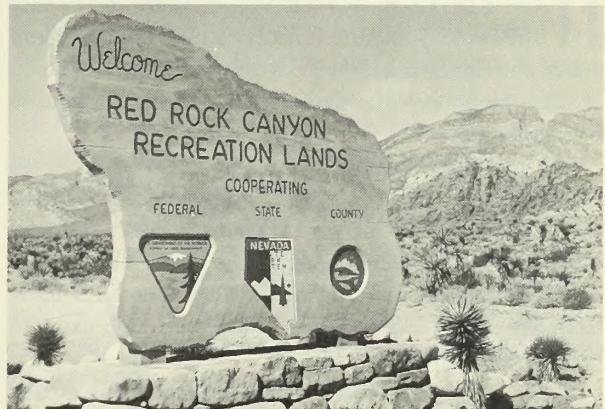
Red Rock Canyon Recreation Lands, the first area on public lands so designated under the 1964 Classification and Multiple Use Act, provide a magnificent setting in which travelers from all States can enjoy a variety of recreational opportunities.

Although it is only 15 miles west of Las Vegas, the area is isolated by mountains and deserts, and is inhabited by unique varieties of plants and animals. Long before Columbus left his Genoa hearthside, the Red Rock country was occupied by primitive people of the Hohokum, Cochise, and other cultures. Their stories, not yet deciphered, are written in the form of petroglyphs



BLM's State Director for Nevada, Nolan Keil, introduces honored guests.
(Photo by Allen Photographers)

**DEDICATED
TO ALL
AMERICANS**



(Las Vegas News Bureau Photo)

that are carved in the rocks throughout the area. There are at least 18 sites where these carvings can be seen.

The official designation of the area as Red Rock Canyon Recreation Lands was the culmination of the efforts of citizens and citizen groups in Clark County, and of local, State, and Federal agencies—all interested in having the area set aside for its recreational values. The dedication was scheduled in conjunction with the 92nd Annual Conference of the American Forestry Association that was being held in Las Vegas at the time. The AFA has consistently supported the proper management of public lands in the interest of the Nation's social and economic growth.

Speakers at the dedication included Senator Alan Bible of Nevada; Harry R. Anderson, Assistant Secretary of the Interior for Public Land Management; Peter

Watzek, President, American Forestry Association; and James G. Ryan, Chairman, Clark County Commissioners.

BLM State Director Nolan F. Keil, who introduced honored guests, said that the area would be developed as a planned recreation complex in cooperation with the State of Nevada. He said that particular attention would be given to the interpretation of the unusual natural and archeological features of Red Rock Canyon.

Red Rock Canyon Recreation Lands are part of an 800,000 acre area that was classified in June 1967 for multiple use management under the provisions of the 1964 Multiple Use and Classification Act. The classification followed numerous public hearings, and was endorsed by local government officials in the Las Vegas area as well as by various wildlife, historical, and archeological organizations.

Recovering a new species of dinosaur

Model of a *Camarasaurus*.
(Photo courtesy of the Smithsonian Institution)



Withdrawing an Old Deposit From a National Treasury

HIGH ABOVE the Grand Valley, south of the city of Grand Junction, Colo., two men on hands and knees were intently carving clay and shale from a group of massive bones—the first of their particular kind to be found on earth.

The two men digging in the clay above Dominguez Creek were, in fact, exposing the skeleton of one of the original owners of our public lands, a new species of sauropod dinosaur belonging to the genus *Camarasaurus*. Nowhere on earth, at that moment, could a more complete skeleton of a large dinosaur be seen exposed in its original grave.

It lay on its left side with its neck and tail arched backward in a 35-foot crescent of rigor mortis, a death pose prescribed by unknown conditions millions of years ago when grey-green mud formed a coffin for the dead dinosaur. Some people think that heavy tendons massed above the animal's backbone contracted considerably after death, pulling the neck and tail backward to form a large semicircle. Others suggest that the huge, bloated bulk drifted along a deep stream channel until it reached shallow water where the main torso grounded at its thickest section. The current then swept the floating tail and neck downstream to form the huge arc. Dinosaur remains have been found in the same position in other places.

Paying "First" Respects

As the men worked, many people from the valleys below stood at the graveside of this early American and gazed in wonderment at the huge skeleton. It might be said they were paying their "first" respects, rather

than their last. The remains of the body buried so long ago were being returned to the light of day to take an important place in a museum where many more people could pay their respects and gaze in amazement at this monster of the past.

The discovery of the skeleton was the result of some careful investigation and exhausting effort by Mr. Daniel E. Jones, his wife, Vivian, and some members of their family from Delta, Colo. The location is picturesquely situated high above the bottom of Dominguez Creek, near its confluence with the Gunnison River. Dominguez Creek Canyon, named after an early Spanish explorer, is carved from some of the earth's oldest rocks, pre-Cambrian pegmatites that originated more than 600 million years ago.

More than a thousand feet above Dominguez Creek are outcrops of clay, sand, and siltstone that are part of the Morrison formation. This formation was named after the town of Morrison, Colo., near Denver, where its "type" section was first studied.

The Morrison formation was deposited on level plains of a shallow inland seafloor. The runoff of abundant rainfall, then prevalent in western Colorado, flowed over the very flat plains and produced a "flood-plain environment." Abundant, migratory sandbars in broad stream channels constantly moved downstream carrying upland materials to the lowlands. In areas of less stream pressure and in temporary shallow ponds and

By JAMES A. JENSEN

Curator, Earth Sciences Museum
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lakes, fine clay-like sediments were deposited. This constant movement of sand and silt included occasional organic remains. These objects, both plant and animal, either fell into the water and were swept away, or were removed by advancing erosion. Wandering stream channels were constantly shifting position to undercut prominent features of the landscape.

A warm, subtropical climate prevailed at an elevation probably less than 2,000 feet, providing an ideal environment for a flourishing plantlife somewhat different from any today.

Giant Sequoias

Plant materials recently studied from the Morrison beds tell us of a forest roof of giant sequoias that gave a third dimension to the otherwise flat land profile. There were abundant seed-bearing, fern-like plants called Cycads which could provide nutritious food for a variety of animals. These animals were largely reptiles, including the great saurpod dinosaurs. Some varieties of these long-necked, long-tailed monsters reached a height of more than 40 feet and weighed over 70 tons. There were also tiny creatures called Rhyncocephalians whose vertebrae were less than one-fourth of an inch long.

One dramatic condition attending the post mortem disintegration of a dinosaur has left no evidence in fossil form. Consider the smell generated by one small, decaying mouse, and then multiply this one ounce of odor into that of a decaying animal weighing 70 tons, or 2,240,000 ounces! The resulting aroma would easily pollute the entire city of Chicago. In any event, the air for a considerable distance about a dead sauropod was certainly heavy with the acrid stench of many tons of rotting flesh, although we have no visible record of this overwhelming circumstance.

Various tooth marks on sauropod bones attest to visits made by scavenging animals, lured to the spot no doubt by the smell. In some cases these looters did considerable damage to the more fragile parts of a carcass like the skull and feet which are seldom found with the remains of sauropod skeletons.

The cause of death for the *Camarasaurus* on the edge of the Uncompahgre Plateau has not yet been determined and may never be known. Old age may have ended its career, or death may have been the result of violent circumstances. A recent discovery in Utah, north of the plateau, has revealed a very large carnivore capable of killing mature sauropods. This discovery is also on public lands, and I am preparing to excavate the skeleton. It appears to be about twice the size of well-known Jurassic predators of 160-180 million years ago,

and will require further study before its identity and a new name can be established.

Extensive excavation around the *Camarasaurus* skeleton revealed some interesting bits of information as well as some additional parts of the animal. The bloated carcass apparently floated downstream on its left side with the ends of its neck and tail trailing along the channel bottom. When excavated at the point of its final burial, the skull and latter portion of the tail were missing. They were either dragged off enroute, were removed by scavengers after the water subsided, or later were carried away by floods when disintegration loosened them from the body.

The right front leg became detached and floated about 25 feet eastward from the shoulder. Part of the pelvis, one of the massive pubic bones, was dislocated to the southeast. This suggests that at least two currents were involved in the final rearrangement of the skeleton.

Camarasaurus is not one of the largest of the sauropods but is characterized as being one of the most robust in body structure. Known species of this genera have neural spines, those down the middle of the back, which are forked from the base of the neck back to number six dorsal vertebrae. Beyond this point, to the pelvis, the spines have a single apex like those of mammals. This newly discovered species is characterized by having dorsal spines forked on all vertebrae from the neck back to the pelvis. It appears to be one of the largest of this genera yet collected. When studies are completed it will be given a proper scientific name, and one more small gap in our knowledge of the development of life on earth will be filled.

A Second Discovery

About 300 yards west of the first discovery, Mr. Jones and his wife found another outcrop of fossil bone which justified a second excavation. Both pits compose the Dominguez-Jones Dinosaur Quarry. Common practice in such matters has been to use the name of some prominent geographical feature nearby plus the finder's name. The quarry is named, therefore, after Dominguez Creek, and the Jones family who recognized the importance of their discovery and promptly reported it to proper authorities.

The second pit produced the anterior section of a sauropod somewhat larger than the *Camarasaurus*. It was also lying on its left side with its tail pointing southeast. The presence of many bone fragments at the site indicated that a large part of the animal had been eroded away. Remaining were the bones of the lower rear leg, part of the pelvis, the anterior half of the tail, and the last vertebra in the neck. This particular verte-

bra displays unusual characteristics not found in other known sauropods.

These two pits, each producing remains of heretofore unknown animals, demonstrate how rockhounds and knowledgeable people like the Jones family can make exciting and valuable scientific contributions. All that is required is an awakened interest in the mysteries of life that are locked in the treasures of the earth's surface.

After the discovery of these two outcrops of fossil bones had been reported by Mr. Jones, I visited the locality and determined it to be a promising site for a quarry. Planning for the project began immediately, but it was almost two years before funds could be obtained, a road built, and an excavation started.

The Triassic sandstone cliffs that tower 1,000 feet above Dominguez Creek made it impossible for the quarry site to be reached from the nearest highway. The Jones family and I searched for an access route from the creek up over the cliffs, but none was found. It was then apparent that a very circuitous route to the top of the Uncompahgre Plateau would have to be found. The Bureau of Land Management's office in Grand Junction surveyed a route to the site. The route was designed to be useful also in future resource development programs of the Bureau. As such, it represents a permanent, public contribution of the project.

The actual cost of constructing some nine miles of new road and improving an additional five miles of access road was borne entirely by the Earth Sciences Museum of the Brigham Young University, a private institution owned and operated by the Church of Jesus Christ of Latter Day Saints (Mormon). The new access road will serve hunters, stockmen, rockhounds, sightseers, the Soil Conservation Service, and BLM.

Visitors Program

Ordinarily the general public is not allowed access to the complex operation of a quarry of this sort. However, as the site is on public land, Keith Miller, district manager for BLM in Grand Junction, and the project director opened the dig to visitors. It was decided that a visitors program would be initiated at the expense and responsibility of the project. Adequate signs marking the quarry route were placed at strategic points, and alterations were made in the quarry procedure. These were intended to offer greater service to visitors by operating the quarry for a maximum period. To accomplish this, it was decided to completely uncover the articulated skeleton in the first pit, without removing any bones, then begin work at the second pit. This left the exposed skeleton in the first pit available for examina-



Dinosaur excavating tools range from bulldozers to the paint brush and ice pick that author James Jensen uses here to uncover a group of tail vertebrae. (Photo by Jim Bond)

tion by the greatest number of visitors. These procedures increased quarrying time by about one-fourth. A walkway was developed around the specimens to provide the best possible views, and a light fence of rods and twine was erected to define the visitor area. This made it necessary to remove the overburden with a wheel-barrow rather than to follow the usual procedure of shoveling it directly behind the workers as each bone was removed.

Although the new road was very rough and required an average driving time of three hours from pavement to bone, some 500 visitors made the trip. They were of all ages and from all professions and walks of life. In one case, a 90-year-old woman was carried up the last steep slope to the "bone hole" to gasp with astonishment at the sight of a real dinosaur skeleton. The exposure of bone in its final burial place was so tangibly realistic that a minister exclaimed, "Now I believe! There really were such things as dinosaurs! I have seen them in museums before, but somehow they were not real to me."

The largest number of visitors each week came on Sundays, although the quarry was not in operation on those days. As a result, quarry employees contributed a full day's work by conducting tours and answering an almost endless string of questions.



Dinosaur digger Dennis Belnap (rear) works in neck region of the skeleton while Lee Perry works on the rib section. Bones in foreground are the tail. (Photo by James A. Jensen)

Among those commonly asked were: Who found it? Where was it found? When was it found? Are there any more hereabouts? Where can we dig? What will be done with it? How much is it worth? How did it get here? How old is it? Many visitors were amazed to learn that while there were probably more than 100 different kinds of dinosaurs, we only know about less than two dozen varieties. Our knowledge of other animals is similarly scant. A world famous paleontologist has estimated that we know about less than five percent of the kinds of animals that have lived upon the earth since its beginning.

National Treasures

It is obvious, then, that the preserved remains of dinosaurs and other animals represent one of our national treasures, one that is vitally important to our pursuit of the fabulous story of how life developed on earth. Unfortunately, it is very probable that the remains of many of these unknown animals are being destroyed by visitors to the public lands, mainly because of a lack of understanding as to their true value.

Dinosaur bone in particular is in great peril. Some rockhounds, possibly unaware of its scientific value, look for dinosaur bone as a material to cut and polish. Not all such bone, however, contains enough silica to

be good polishing material, and dislodged and fractured dinosaur bone, dug up in search of more "valuable" cutting material, is common in the Morrison formation. During a five year period I have seen a great amount of scientific material that has been unwittingly destroyed by enthusiastic rockhounds and other visitors to the public lands. Most rockhounds, however, are both knowledgeable and cooperative, and are to be commended for their assistance in protecting scientific values. The Jones family, for example, may well be proud of the responsible action it took. In addition to making a significant contribution to our knowledge of the past through the discovery of two unknown, extinct animals, the family was wise enough to leave the discovery site undisturbed for study and excavation by professionals.

Visitors to the quarry also were interested in how much money the museum would realize from the bones collected. The truth is, nothing! After spending thousands of dollars to collect such a specimen, the equivalent of one man's skilled labor for 20 years is required for scientific study before it is mounted. A mounted dinosaur in a museum represents an investment of \$40,000 to \$80,000.

It is hoped that visitors to the quarry, as guests of the Earth Sciences Museum, gained a better understanding of the values of scientific materials on the public lands, and of the roles that science and the Bureau of Land Management play in their development and use. □

A worker carefully exposes a portion of the tail. (Photo by James A. Jensen)





BONSAI

Dwarfing Trees for Beauty

THE ART of Bonsai, ancient in Japan when Americans were fighting for their independence, has created a demand for a unique public land resource—stunted trees.

Bonsai (bone-sigh) is the art of growing dwarfed trees. Following contacts with Japanese Bonsai growers

during the occupation of that country after World War II, American troops brought appreciation and techniques of the art to the United States. Many kinds of trees can be dwarfed through manipulation of their root development. If root growth is limited, above ground growth is bound by what the root system can feed. Under the skilled hands of the Bonsai artist, a maple or a juniper that would normally reach towering heights stops upward growth after a few feet, yet develops other features characteristic of great age. Miniature trees are planted in trays and pottery and arranged so that the tree becomes a part of a pleasing miniature landscape. It is this aesthetic blending of line and mass into a harmonious whole that distinguishes a true Bonsai from a mere potted plant.

The more twisted, gnarled, and windblown such a tree appears, the greater its value. Value also increases with age. Some Bonsai trees are known to be hundreds of years old.

The Bonsai enthusiast obtains trees in many ways. Some start from seed; some buy potted plants from nurseries. A simple method is to locate stunted trees already dwarfed by natural conditions.

Recently members of the Bonsai Club of Santa Ana, Calif., turned to the public lands in search of trees suitable for Bonsai. Their search led them far from California, but they found what they were looking for in southwest Utah. There among the cliffs and craigs of an austere landscape are trees whose entire life has been a struggle to survive. Shaped by harsh wind and conditioned by broiling sun, these stunted but determined trees, pinyon and juniper, have retained a precarious foothold in the meager soils collected in shallow pockets or in crevices between rocks.

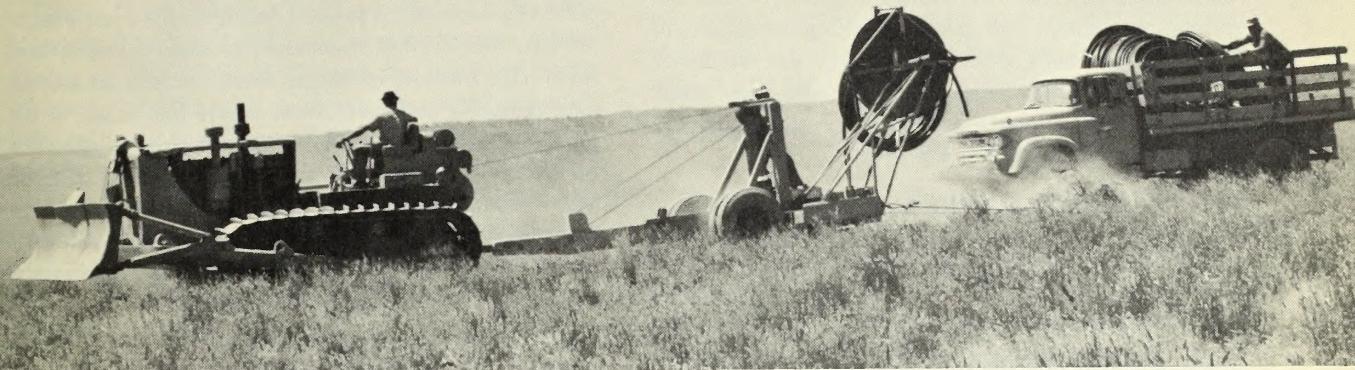
Carefully removed from their natural site and as carefully potted, these trees are easily trained to conform to the graceful lines of classic Bonsai.

After locating the source, club members visited BLM's Cedar City district office to request permission to remove the trees from public land. Club members received free use permits, and the BLM staff learned about a fascinating new hobby. □

By CECIL M. JORGENSEN

BLM Natural Resource Specialist
Cedar City, Utah

PROGRAM FOR PEOPLE



Laying plastic pipe in Oregon. The operation stops only to put on another roll of the pipe carried in the truck following.

Incentive awards benefit both BLM and its people

A SURVEYOR IN interior Alaska . . . a Washington Office secretary . . . a supervisor who rescues two men trapped in the blazing wreckage of their aircraft . . . a Nevada range crew building irrigation systems . . . an administrator at midpoint in an outstanding career . . . a group of Eskimo firefighters. . . . One program touches all these scattered employees of the Bureau of Land Management. The Incentive Awards program affects all of them.

Part of a Governmentwide system, the program reaches employees in all grade and organizational levels, and is valued by supervisors as an effective management tool. Awards are designed to give exceptional employees some recognition to distinguish them from those who are satisfied with routine performance and the status quo.

Recognition is accompanied by cash, by honor award, or by both. Inventive employees receive cash awards for adopted suggestions which improve equipment, procedures, or any other aspect of an operation. Cash performance awards are granted for consistently superior work over a period of time, as well as for achievements

in connection with a one-time project. Employees may receive a single award check, or a quality increase in salary which adds to their income over a period of time.

A Variety of Awards

Honor Awards, of which most are granted at Department level, include Distinguished, Meritorious, and Commendable Service awards for overall career achievement. The Valor Award is a gold medal and citation that is granted for heroic action in emergency situations involving a high degree of personal risk. Unit Awards for Excellence of Achievement are designed to recognize outstanding team efforts.

Tailored especially for BLM is the Appreciation Certificate for Fire Protection. It is presented to persons such as seasonal firefighters, local fire protection organizations, and others who contribute significantly to the Bureau's protection program. Similar certificates are awarded to Advisory Board members in appreciation of their assistance and support for BLM range management operations. Bureau smokejumpers receive a jacket emblem, and to wear with it they are awarded a special tab after making an impressive 50 jumps.

The awards program is administered by three committees. The field committees in the Denver and Portland Service Centers are headed, respectively, by Crawford Laurent and Ralph Carpenter. The Bureau Incentive Awards Committee, chaired by Lewis T. Miller, handles award matters of Bureauwide scope, as well as cases arising directly from the Washington Office.

By ABIGAIL DUNNING

BLM Management Analyst
Washington, D.C.

Discussing incentive awards goals, Mr. Miller stresses that the program benefits not only the employee but the Bureau as a whole. The suggestion system yields direct returns in cost reduction and work improvement. Through the medium of suggestions, employees and top management can communicate directly about operating procedures and problems. Employees benefit from management's broad perspective and authority to implement ideas; management, on the other hand, gains the benefit of on-the-ground observation, analysis, and problem solving.

Ideas Save Time and Money

Through the incentive awards clearing house, ideas which save time and money in one office can be adapted and publicized for Bureauwide use. The suggestion system is also useful as a spot check on a particular program or subject field. A high volume of suggestions concerning one activity or operation may show a need for survey and evaluation of procedures involved.

Perhaps the most significant contribution of the program is its effect on BLM's most valuable asset, its personnel. By satisfying the universal human need for recognition and appreciation of work well done, awards help maintain high morale and motivate employees to work at their greatest capacity. As it operates throughout the Bureau, the incentive awards program has an individual, personal impact on employees in widely varied occupations.

In Alaska, a helicopter pilot and his assistant complete a flight. They have dropped 25 survey monuments in one day, using the Cubic Range Autotape System developed by Jerry R. Harris of the Portland Service Center. His system is an ingenious modification of methods designed for hydrographic surveys from boats. Equipment, mounted in a helicopter and on the ground, measures distances between the hovering aircraft and ground stations that are a known distance from each other. Given these distances, a computer plots the location at which to drop the next monument. Accurate drops can be made under any weather conditions which permit flight. Using this system, BLM crews can survey 550,000 acres each month, increases of 300,000 acres over previous aerial techniques and of 495,000 acres over conventional transit-and-tape methods.

In the Washington Office, a young secretary receives a Superior Performance Award. She may treat herself to a new wardrobe, or spend the check gratefully on her husband's college tuition bill. At the same time, she may decide that the Government offers not only challenges but the kind of rewards worth working for.

For Courageous Action

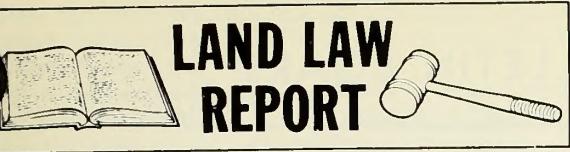
In Idaho, an Assistant Fire Control Officer, George Presley, is supervising the loading of a helicopter carrying personnel to a nearby fire. The helicopter takes off, wavers, and crashes. The pilot is seriously injured but extricates himself from the cockpit as the craft begins to burn. Mr. Presley drags one passenger to safety and races back into the mounting fire to release the second man from his seat belt. As he clears the wreck, it explodes in flames. Mr. Presley modestly didn't consider himself a hero, but BLM was proud to present him the Valor Award for courageous action without regard to personal safety. He subsequently received an additional award through a private foundation, the Carnegie Hero Fund.

In Oregon, a range crew lays plastic pipe, using a system developed through a series of employee suggestions. They are operating a tractor and trailer rig equipped with a scarifier arm and a special laying foot. As the tractor moves forward, the arm digs a trench and pipe unreels into it through the foot. A loop of heavy anchor chain dragging behind then pushes earth over the pipe and fills the trench, all in one continuous operation. Under the previous system, the tractor or a grader dug the trench and was followed by a truck carrying the pipe and a crew to lay it. By modifying standard machinery to do a more efficient job, suggesters saved manhours and equipment time. Three suggesters received awards totaling \$650 for their part in developing the system.

With 15 years in Government service, a systems analyst receives a Distinguished Service Award for sustained, superior service. Although such awards are often reserved for retirement, the Bureau Committee encourages recognition of qualified employees regardless of their age or length of service.

And in a snowswept Eskimo settlement, State Office officials hand the village headman a certificate of appreciation and letters of thanks. The men of his village, trained as seasonal firefighters by BLM, were flown to critical forest fires during the previous summer. Their daring and professional competence saved thousands of acres of timber from destruction. Hanging in the village hall, the certificate is a tangible symbol of the contributions made by the Eskimo people as tribal ways are modified to meet the demands of modern society.

As a management device, the incentive awards program helps achieve the goals of cost reduction and work improvement. As a source of personal satisfaction, it has significant impact on some of the Bureau's finest employees. □



LAND LAW REPORT

Since June 1966 the Public Land Law Review Commission has held public meetings in 10 regions of the United States to hear citizen's views on public land matters. Records of meetings will aid the Commission in considering all facets of the public interest when making its final report to Congress. The opinions expressed have reflected the diverse viewpoints and interests of many individuals and groups. Some of the more commonly stated opinions follow.

Grazing

Security of tenure on public lands is needed for well-planned livestock operations. •Users should be reimbursed for loss of privileges caused by land withdrawals. •Users can accomplish range improvements more economically and practically than the Federal Government; users should be encouraged through tenure to use private funds for improvements. •Permittees on the public range should have some degree of control over other users. •No change should be made in the management of grazing units without the permittees' consent. •When computing range use fees, users' expenses in maintaining improvements and other variables should be considered. •Federal lands should be disposed of to permittees at prices based on the land's productive value.

Land Exchanges and Acquisitions

Legal mechanisms of land exchanges should include provisions for cash payment for equalization. •When the Federal Government acquires private lands, Government lands should be exchanged in payment wherever possible, and acquisition should be limited to acreage that is essential to the immediate purpose.

Timber

Reexamine Federal forest management plans in light of present-day markets. Revise downward, present rotation periods. •Federal forest lands should be administered for the benefit of resource-based communities and industries. •Public ownership of lands in National Forests such as critical watersheds and key recreation areas should be increased.

Nonfuel Minerals

Mining should be a priority use on public lands; mineral resources are limited, and lands can be restored to other uses after mining operations end. •Mining should be on a lease basis so the Federal Government can control surface resources and require restoration of the land. •Unpatented mining claims should be recorded with the Bureau of Land Management.

Energy Fuels

Acreage limitations should be increased to encourage development, and eliminated altogether on known geologic structures. •Leases should not be terminated automatically for minor errors without giving the leaseholder reasonable opportunity to make corrections. •When lack of a market delays production, leases should be extended until a market is available.

Water

Federal agencies should conform to State laws in governing the appropriation, control, and distribution of water. •The withdrawal or reservation of public lands should not effect water rights acquired under State law, either before or after such withdrawals. •Specification is needed on the types of water rights suits in which the United States has consented to be joined.

Outdoor Recreation

Land and water conservation funds should be supplemented by revenue derived from mineral leasing. •Wilderness classification does not permit sound land and resource management. •Recreationists and sportsmen should bear a share of state and local government costs. •Inholdings in wildernesses should be purchased by the Federal Government to preserve the integrity of these areas. •The Wilderness Act should be amended to exclude mining in wildernesses. •Acreage limitation on land transfers under the Recreation and Public Purposes Act should be expanded.

Fish and Wildlife

Jurisdiction of wildlife resources on Federal lands belongs to the States. •Make greater use of wildlife refuges for hunting. •Review predator control programs to see if they are necessary. •Fencing of public lands should not interfere with migration or movement of game animals.

PUBLIC SALE BULLETIN BOARD

This is a compilation of the most up-to-date information possible on up-coming sales of public lands by land offices of the Bureau of Land Management. For details of land descriptions, prices, and other information pertinent to sales, you must write the individual land office concerned. In most cases, there are adjoining landowners who have statutory preference rights and may wish to exercise them to buy the land. Sales notices will point out, insofar as possible, problems relating to (1) access, (2) adjoining owner preference rights, (3) small-tract sales limitation of one per customer, and other pertinent information. When possible, all sales are scheduled far enough in advance so ample notice can be given in Our Public Lands. Sales listed can be canceled on short notice for administrative and technical reasons. A listing of BLM land offices with addresses is found on the opposite page.

Key: A, acre; app, appraised; est val, estimated value; Cty, County; veg, vegetative; pot, potential; pub, publication cost; elec, electricity; tel, telephone.

ARIZONA

Public Sale Tracts

2 tracts, totaling 120 A, 1½ miles north of Duncan, Greenlee Cty. Access via gravelled Cty road. All utilities. Moderately rolling to gently sloping foothills. No improvements. Veg sparse; low grazing pot; limited pot for homesites. Est val \$9,000.

80 A, 1½ miles south of Interstate Highway 10, 10 miles east of Bowie, Cochise Cty. Access limited, controlled by patented land. Flat to moderately flat with agriculture pot. All utilities; no improvements; veg sparse. Sandy to sandy clay loam soils. Est val \$4,400.

40 A, 5 miles southwest of Apache, Cochise Cty. Access by State Highway 80 which traverses parcel east to west. All utilities; good veg; grazing pot. Flat to gently rolling. Livestock fence only improvement. Est val \$1,800.

160 A, 12 miles west of Tombstone, Cochise Cty. Ranch road across private land gives access from State Highway 82 to ½ mile; then by 4-wheel drive. No utilities; powerline 1½ miles along Highway 82. Val \$7,200, plus pub \$30.61.

40 A, 25 miles northwest of Phoenix, 3 miles north of Beardsley, Maricopa Cty. Access via U.S. Highways 60, 70, 89, 93, Kimball Road and desert trail. Flat desert land; annual grasses. Oil and gas to the United States. Val \$7,400 plus pub \$18.90.

40 A, 2½ miles east of Sonoita, Santa Cruz Cty. Access via graded road from Sonoita to Elgin. Desert grassland, gently rolling. Severe gully erosion over less than 5 A. Oil and gas to United States. Val \$9,000 plus pub \$45.00.

2 tracts, 3½ miles south of Sierra Vista, 18 miles southwest of Tombstone, Cochise Cty. Do not join; sold as separate units. No access, utilities. Flat to gently rolling. Borders on Fort Huachuca Military Reservation. Val \$7,550 plus pub \$25.20; \$3,350 plus pub \$25.20.

40 A, 8 miles south of Safford, Graham Cty. Access via U.S. 666. Utilities available; no improvements. Suitable for grazing; homesite pot. Gently rolling to hilly. Approximate val \$50 to \$80 per A.

40 A, 1 mile southwest of Humboldt. Access via ranch road from State Highway 69. Tel and elec available. Water available by drilling well. Nonagricultural grassland with sparse juniper and oak brush. App \$8,000 plus pub \$56.20.

CALIFORNIA

138 tracts in 10 areas of San Bernardino Cty. All available for sale each Wednesday in the Riverside Land Office. Query for details.

Public Sale Tracts

280 A, 2 miles west of Canby, Modoc Cty. Sharply rising hills with flat, rocky plateau at summit. Stony soil; no public access; no water. Cheat grass and sage brush. App \$1,600 each 40 A.

.37 A app \$390, and .21 A app \$260. 3 miles from Grass Valley, Nevada Cty. Both triangularly shaped. Surrounded by patented mining claims.

MONTANA

Public Land Sale Tracts

40 A, 26 miles northeast of Circle. Rolling, with parts level enough for cultivation. Cty road on south side. Grazing permitted; no improvements. App \$920.

80 A, 5 miles south of Jordan. Rolling prairie, many broken areas. Not suited for cultivation. Under grazing permit; no improvements. App \$960.

40 A, 10 miles northeast of Ekalaka. Steep; broken. Under grazing permit. Developed spring. App \$580.

320 A app \$3,840, and 315 A app \$3,783. 50 miles east of Miles City. Access over 3 miles ranch trail off Highway 12. Being used for grazing. No improvements; no stockwatering facilities.

40 A app \$720, 418 A app \$6,480, and 200 A app \$3,600. 35 miles southeast of Ekalaka. Land varies from rough and brok-

to level flats. Flats vary from hard pan with scattered veg to clay loam prairies with good veg. Use is grazing. Access by ranch trail across private lands.

20 A, southwestern Garfield Cty. Rolling to broken; good native grasses. Being used for grazing; fenced on east and west. Access by graded dirt road. App \$3,120.

160 A, 15 miles southeast of Circle. 20 A can be cultivated; rest is rough grazing land. Under grazing permit. Corral; good truck trail on south edge; railroad on north. App \$3,202.

40 A, 17 miles south of Circle. About 35 A can be cultivated. Being used for grazing. Access by ranch trail across private lands. App \$993.

40 A, 22 miles south of Circle. Mostly a rolling ridge between drainages. Being used for grazing. Cty road passes near. App \$680.

160 A app \$2,720, and 40 A app \$680. 24 miles northwest of Circle. Rolling to rough with 100 A of creek bottom. About 14 A could be cultivated. Being used for grazing. Access by private trail on private lands.

40 A, 15 miles southeast of Ekalaka. Rolling to nearly level; cultivable. Being used for grazing. Access by private truck trail on private lands. App \$860.

280 A app \$3,640, and 640 A app \$8,327. 13 miles southeast of Circle. Rough grazing lands. Access by private trail on private land.

40 A app \$680, 40 A app \$560, and 80 A app \$1,360. 7 miles southwest of Two Dot. Producing native grasses; no range improvements. Access to within $\frac{1}{4}$ to $\frac{3}{4}$ miles by $2\frac{1}{2}$ miles fair weather trails, then on foot.

40 A, 4 miles west of Chinook. Non-irrigable; no improvements. Access by Cty road and $\frac{1}{4}$ mile private road. App \$800.

NEVADA

13 tracts totaling 16,106 A. 10 miles northeast of Sparks. Level to rough and mountainous. Desert grasses, shrubs, some juniper. Grazing probably is best use. No access to most of land. Tracts vary in size and value. Query Land Office.

Public Land Sale Tracts

160 A, in Antelope Valley, Lander Cty, 65 miles southwest of Battle Mt. Gently sloping with shadscale and budsage veg. Graveled road access. Open zoning, no irrigation water.

94 A, Lander Cty, $1\frac{1}{2}$ miles southwest of Battle Mt. Flat with greasewood and sagebrush veg. Tel and elec available. Access from State Highway 8A. Zoning for ranch-agriculture.

320 A, White Pine Cty, 7 miles north of El Dorado Station. Level, has been plowed. Veg. annual weeds. Suitable for agricultural reclamation. Cased well. Access by unimproved dirt road.

$2\frac{1}{2}$ A, 2 miles north of Reno. Level, stony soils, sagebrush and cheatgrass. Access via Hoge Road. Elec and tel available. Zoned as residential single family-first estates.

960 A, 16 miles northeast of Carson City. Rolling. Greasewood and hopsage. Elec available. Access via Six Mile Canyon Road.

Monthly auctions are held in the Las Vegas and the Reno-Carson City areas in which public land tracts are offered at public sale. Tracts offered are primarily suitable for urban or suburban development, including residential and industrial uses consistent with local land use plans. Query Reno Land Office for values and values of specific parcels.

NEW MEXICO

Public Sale Tracts

280 A, 1 mile east of Farmington. Rough, non-arable, sparse grasses. Annual precipitation 7 inches. Water availability unknown. App \$9,800.

80 A, 4 miles south of Rodeo. Grazing land, shallow soils. No utilities. App \$1,100.

OREGON

Public Sale Tracts

17 tracts totalling 1,267 A. Umatilla Cty, some west of Pendleton; some southwest of Pilot Rock. Generally rangeland, unsuitable for crops. Sizes and appraisals vary. Query Land Office.

SOUTH DAKOTA

80 A, 7 miles west of Wall. Not cultivable. Being used for grazing. Access on foot over private land. App \$2,120.

WYOMING

Public Sale Tracts

40 A, 2 miles southwest of Laramie. No access available. Climate, soil and terrain preclude farming. App \$3,200.

$2\frac{1}{2}$ A, 18 miles north of Cody. Rolling, rough, sagebrush. Grazing most suitable use. No watering facility; no legal access. App \$405.

233 A, 9 miles southwest of Fort Laramie. Rough; grazing land. No access. Stock water available from nearby creek. No water on land. App \$3,380.

Bureau of Land Management Land Offices

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555 Cordova St. Anchorage, Alaska 99501	Federal Bldg., 300 Booth St. Reno, Nev. 89505
516 Second Ave. Fairbanks, Alaska 99701	NEW MEXICO (Okla.): Federal Bldg.
ARIZONA:	Santa Fe, N. Mex. 87501
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Federal Bldg., Room 4017 Sacramento, Calif. 95814	Salt Lake City, Utah 84110
1414 Eighth St. Riverside, Calif. 92502	WASHINGTON: 729 Northeast Oregon St. Portland, Oreg. 97232
COLORADO:	WYOMING (Nebr., Kans.): 2120 Capitol Ave. Cheyenne, Wyo. 82001
14027 Federal Bldg. Denver, Colo. 80202	ALL OTHER STATES: Robin Bldg. 7981 Eastern Ave. Silver Spring, Md. 20910
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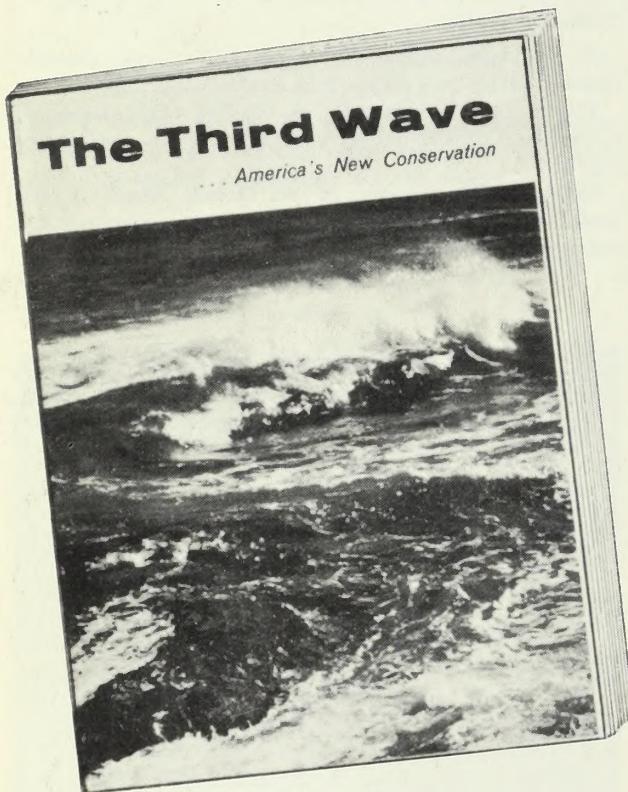
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